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Pre-service teachers' perceived internet self-efficacy and levels of internet use for research

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Abstract

The present study aims to identify the relationship between pre-service teachers' perceived Internet self-efficacy and their levels of Internet use for research and to examine perceived Internet self-efficacy in terms of certain variables. It is a descriptive study aiming to reveal an existing situation. The study sample consists of 267 pre-service teachers studying in the Faculty of Education at Ahi Evran University. The study data were collected by using a personal information questionnaire, a perceived Internet self-efficacy scale, and an instrument to assess the level of Internet use for research. The results of the study demonstrated that there is a significant and moderate relationship between the pre-service teachers' perceived Internet self-efficacy and levels of Internet use for research, and that perceived Internet self-efficacy differed in terms of the variables examined.

Keywords: Internet; self-efficacy; Internet self-efficacy; research on the Internet; pre-service teacher.

1. Introduction

Perceived self-efficacy, one of the key concepts of Bandura's social learning theory, is defined as "the conviction that one can successfully execute the behavior required to cope with given situations" (Bandura, 1977). It is particularly underlined that self-efficacy is an individual's belief that s/he can perform a behavior, regardless of s/he can actually perform that behavior (Bandura, 1995). Achievement does not simply rely on possessing the skills required to perform a task; it also necessitates the effective and confident use of those skills (Bandura, 1997). Self-efficacy belief is affected by different experiences such as an individual's cognitive processes including his/her past experiences resulting in achievement or failure and his/her experiences based on observations about others' achievements or failures, persuasion process (approval of one's family, friends, and colleagues), and affective processes (experiencing intense emotions such as excitement, anxiety, and fear) (Bandura, 1995: Akkoyunlu and Orhan, 2003). A concept developed in the field of social psychology, self-efficacy has been adapted to many different fields and employed in various disciplines (Akkoyunlu and Kurbanoğlu, 2004). Perceived computer self-efficacy, perceived information literacy self-efficacy, and perceived

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Internet self-efficacy can be cited as examples of these fields (Tsai and Tsai, 2003; Akkoyunlu and Kurbanoğlu, 2004; Wu and Tsai, 2006; Rains, 2008).

Internet self-efficacy and research on the Internet, which constitute the subject of this study, are of considerable importance for lifelong learning in today's information societies. Learning to learn is considered as the key to success and lifelong learning in the information age (Doyle, 1994). Information literacy is one of the building blocks of lifelong learning and learning to learn. Educational institutions that are responsible for educating individuals needed by the society are expected to raise individuals who are equipped with information literacy skills (who can access constantly changing information they encounter in various forms from different sources when they are in need of information, can use, produce, and transfer information) and can effectively use technology for various purposes. Defined as the international network, the Internet is one the technologies most commonly used today to share and quickly access to information. In the face of changing teacher's roles, it is very important that teachers are informed about the techniques to have access to the information and information sources on the Internet and how to obtain information through the Internet. Thus, as guides and advisers, they will be able to help their students by showing them where and how to access to information. However, searching and obtaining information using the Internet in a research process does not simply depend on possessing these skills. In addition to these skills, it could be argued that teachers' perceived Internet self-efficacy also influence the way these skills are used. In this context, perceived Internet self-efficacy is cited as a significant variable for teachers to search and access to, and obtain information on the Internet (Joo, Bong and Choi, 2000). In their study examining the relationship between Internet self-efficacy and researching on the Internet, Joo, Bong and Choi (2000) emphasized that individuals' Internet self-efficacy is closely correlated with the results they obtain from the Internet. Tsai and Tsai (2003) argue that students' strategies to access to information and learning products are influenced by Internet self-efficacy in Internet-based learning environments. It is suggested that students with high Internet or computer self-efficacy are more successful in online courses, one of the chief reasons for which is their high confidence and motivation that they can perform the operations on the Internet (Güngör and Aşkar, 2004).

This study aims to identify the relationship between pre-service teachers' perceived Internet self-efficacy and their levels of Internet use for research and to reveal whether perceived Internet self-efficacy differs in terms of the grade level and department of study and the frequency of Internet use for research purposes.

The study will attempt to seek answers to the following questions to realize the study purpose:

a. Do the pre-service teachers feel that they are efficient in general Internet use?
b. What are the pre-service teachers' perceived Internet self-efficacy and levels of Internet use for research?
c. Is there a significant difference in the pre-service teachers' perceived Internet self-efficacy with regard to their departments, grade levels, and frequency of Internet use for research?
d. Is there a significant relationship between the pre-service teachers' perceived Internet self-efficacy and their levels of Internet use for research?

2. Method

This is a descriptive study conducted to identify the relationship between pre-service teachers' perceived Internet self-efficacy and their levels of Internet use for research and to reveal whether perceived Internet self-efficacy is influenced by certain variables. The study sample consists of a total of 267 pre-service teachers in their 1st and 4th years of study in the Departments of Science Teacher Training, Primary School Teacher Training, Social Studies Teacher Training, and Turkish Teacher Training of the Faculty of Education at Ahi Evran University.

A personal information questionnaire was used to identify the pre-service teachers' departments and grade levels, gender, frequency of Internet use for research, and to determine why they do not use the Internet for research purposes. A scale called the Levels of Internet Use for Research developed by the researchers was employed to identify the pre-service teachers' levels of Internet use for research. The researchers drew upon the studies by Küçük (2002), Ersoy and Aktay (2007) while developing the scale. The prepared assessment instrument is composed of 24 items presented in the five-point Likert format. Expert opinion was obtained to determine the validity of the assessment instrument. Factor analysis was performed to identify the internal

validity of the instrument and the items' primary factor loadings were found to range between 0.30-0.67. The Alpha reliability coefficient of the instrument was found to be 0.88, while its test/half-test reliability coefficient was found as 0.75. In order to identify the pre-service teachers' perceived self-efficacy for Internet use, the researchers used the section on general Internet use self-efficacy of the Online Technologies Self-Efficacy Scale (OTSES) developed by Miltiadou (1999), which includes 9 questions and was translated into Turkish by Küçük (2002). In Küçük's (2002) study, the scale's Alpha reliability coefficient was calculated to be 0.90. The study data demonstrated that the scale's Alpha reliability coefficient was 0.89. Furthermore, according to the factor analysis, primary factor loadings for the scale items ranged between 0.58-0.82. In the scale, the pre-service teachers were asked to rate themselves from 1 to 10.

In the study, one-way variance analysis and independent sample t-test were used and Pearson's correlation coefficient was calculated for data analysis. The significance level of 0.05 was used to interpret the findings.

3. Results (Findings)

The findings obtained from the study are discussed in order below under headings about the sub-problems attempted to be answered in the study.

3.1. Pre-service teachers' perceived self-efficacy about general Internet use

Table 1 presents the pre-service teachers' mean scores on the questions concerning perceived self-efficacy about general Internet use.

Table 1. Mean scores on the questions concerning perceived self-efficacy about Internet use

Questions about general Internet use	N	Mean ($\overline{X}$)	SD
Opening a web browser (e.g. Explorer or Firefox)		6,98	2,92
Reading text from a web site		8,27	2,17
Accessing a specific web site by typing the address (URL)		8,24	2,28
Bookmarking a web site		7,67	2,63
Printing a web site	267	7,05	2,76
Conducting an Internet search using one or more keywords		7,81	2,39
Downloding (saving) an image from a wb site to a disk		6,70	2,94
Copying a block of text from a web site and pasting it to a document in a word processor		7,63	2,82
Preparing a simple web site including texts,visuals (pictures, graphics, diagrams etc.) and links		5,60	2,95

As seen in Table 1, all the mean scores of the pre-service teachers on the questions concerning perceived Internet use self-efficacy are above the acceptability limit (5.00) (Küçük, 2002). It was observed that the pre-service teachers had the greatest self-confidence while reading text from a web site ($\overline{X}$=8.27), whereas they had the least self-confidence when preparing a simple web site including texts, visuals, and links ($\overline{X}$=5.60).

3.2. Pre-service teachers' perceived Internet self-efficacy and levels of Internet use for research

Table 2 shows the findings about the pre-service teachers' mean scores on perceived Internet self-efficacy and levels of Internet use for research.

Table 2. Mean scores on perceived Internet self-efficacy and levels of Internet use for research

	N	Mean ($\overline{X}$)	SD
Perceived Internet self-efficacy	267	65,96	17,37
Levels of Internet use for research		76,01	13,91

Table 2 summarizes the means of the obtained scores and shows that the pre-service teachers general mean score on perceived Internet self-efficacy is $\overline{X}$=65.96 and their general mean score on levels of Internet use for research is $\overline{X}$=76.01. From these results, it could be concluded that the pre-service teachers had an above-moderate level of perceived Internet self-efficacy and a moderate level of Internet use for research.

3.3. Differentiation between the pre-service teachers' perceived Internet self-efficacy according to their departments, grade levels, and frequency of Internet use for research

Table 3 presents the distribution of the pre-service teachers' mean scores on perceived Internet self-efficacy according to their departments.

Table 3. Mean scores on perceived Internet self-efficacy according to departments

Departments	N	Mean ($\overline{X}$)	SD
Science Teacher Training	72	64,65	18,97
Primary School Teacher Training	62	69,47	15,36
Turkish Teacher Training	62	60,35	18,49
Social Studies Teacher Training	71	69,11	15,06
Total	267	65,96	17,37

An examination of the pre-service teachers' mean scores on perceived Internet self-efficacy according to their departments in Table 3 reveals that the highest mean score ($\overline{X}$=69.47) was obtained from the pre-service teachers studying in the Department of Primary School Teacher Training, while the lowest mean score ($\overline{X}$=60.35) belonged to those studying in the Department of Turkish Teacher Training. Table 4 shows the results of the variance analysis on whether the differences between the means were significant.

Table 4. Results of the variance analysis on the mean perceived Internet self-efficacy according to departments

	Sum of squares	df	Mean squares	F	Sig.	Mean Difference
Between groups	3539,50	3	1179,83	4,05	0,008	2-3
Within groups	76673,05	263	291,53			3-4
Total	80212,55	266				

Table 4 demonstrates that there was a significant difference between the pre-service teachers' perceived Internet self-efficacy according to their departments ($p<0.05$). A Scheffe test was carried out to identify the groups between which the differences between the mean scores were significant and the results of the test revealed that the perceived Internet self-efficacy of the pre-service teachers studying in the Departments of Primary School Teacher Training and Social Studies Teacher Training were higher than those of the pre-service teachers studying in the Department of Turkish Teacher Training.

Table 5 shows the distribution of the pre-service teachers' mean scores on perceived Internet self-efficacy according to their grade levels and the results of the t-test on whether the difference between the mean scores was significant.

Table 5. Results of the t-test on the difference between the mean scores on perceived Internet self-efficacy according to grade levels

Grade levels	N	Mean ($\overline{X}$)	SD	t	Sig.
1st year	128	61,55	18,49	4,09	0,000
4th year	139	70,01	15,23		

Table 5 shows that the mean perceived Internet self-efficacy score of the pre-service teachers in their 1st year was $\overline{X}$=61.55, while the pre-service teachers in their 4th year had a mean perceived Internet self-efficacy score of $\overline{X}$=70.01. The t-test was used to determine the significance of the difference between the means and it was observed that the difference between the mean scores was higher in favor of the perceived Internet self-efficacy of the fourth-grade pre-service teachers ($p<0.001$).

The distribution of the mean scores obtained from the general Internet use self-efficacy scale according to the pre-service teachers' frequency of Internet use for research is presented in Table 6.

Table 6. Mean scores on perceived Internet self-efficacy according to the frequency of Internet use for research

Frequency of Internet use for researh	N	Mean ($\overline{X}$)	SD
Always	71	74,48	14,58
Usually	131	66,44	15,53
Sometimes / Rarely	65	55,68	18,51
Total	267	65,96	17,37

As seen in Table 6, the pre-service teachers who always used the Internet for research had the highest mean score on perceived Internet self-efficacy ($\overline{X}$=74.48), while those who sometimes or rarely used the Internet for research had the lowest mean score ($\overline{X}$=55.68). Table 7 presents the results of the variance analysis on whether the difference between the means was significant.

Table 7. Results of the variance analysis on the mean perceived Internet self-efficacy according to the frequency of Internet use for research

	Sum of squares	df	Mean squares	F	Sig.	Mean Difference
Between groups	1205,29	2	6028,15	23,35	0,000	1-2
Within groups	68156,25	264	258,17			1-3
Total	80212,54	266				2-3

As shown by Table 7, there was a significant difference between the pre-service teachers' perceived Internet self-efficacy according to their frequency of Internet use for research ($p<0.001$). A Scheffe test was carried out to identify the groups between which the differences between the mean scores were significant and the results of the test revealed that the perceived Internet self-efficacy of the pre-service teachers who always used the Internet for research was higher than that of the pre-service teachers who usually and sometimes used the Internet. Furthermore, it was also observed that the pre-service teachers who usually used the Internet had higher perceived Internet self-efficacy than those of the pre-service teachers who sometimes used the Internet.

3.4. Relationship between the perceived Internet self-efficacy and levels of Internet use for research

It was demonstrated that there was a positive moderately significant relationship between the pre-service teachers' mean scores on perceived Internet self-efficacy and their mean scores on their levels of Internet use for research ($p<0.01$, $r=+0.52$, $N=267$).

4. Conclusion and Recommendation

In this study that examined the relationship between the pre-service teachers' perceived Internet self-efficacy and levels of Internet use for research and Internet self-efficacy in terms of certain variables, the following results were obtained.

It was observed that all the mean scores obtained by the pre-service teachers on the questions concerning perceived Internet use self-efficacy were above the acceptability limit. Küçük (2002) also reached similar results in a study on instructors.

It was demonstrated that the pre-service teachers had above-moderate levels of perceived Internet self-efficacy and moderate levels of Internet use for research. A study by Liang and Tsai (2008) also found a moderate level of perceived Internet self-efficacy among pre-service teachers. In a study they carried out in three universities in Taiwan, Wu and Tsai (2006) reported considerably high levels of perceived Internet self-efficacy among university students. In their study, Gündüz and Özdinç (2008) demonstrated that second-level primary school students had above-moderate perceived Internet self-efficacy. In a study, Ersoy and Aktay (2007) found that the pre-service teachers used the Internet at a moderate level while preparing their projects and assignments. Moreover, in another study on instructors, Küçük (2002) arrived at similar results.

It was shown that the perceived Internet self-efficacy of the pre-service teachers studying in the Departments of Primary School Teacher Training and Social Studies Teacher Training were higher than those of the pre-service teachers studying in the Department of Turkish Teacher Training. The higher perceived Internet self-efficacy of the pre-service teachers studying in the Departments of Primary School Teacher Training and Social

Studies Teacher Training could be attributed to the quality of the courses offered in these departments and of the assignments and projects in these courses. In their study, Akkoyunlu and Kurbanoğlu (2003) observed that the pre-service teachers' information literacy and perceived computer self-efficacy significantly differed according to their departments. Moreover, Çavuş et al (2007) also reported that perceived computer self-efficacy varied from one department to another.

It was found in the study that the pre-service teachers studying in the fourth grade had higher perceived Internet self-efficacy than those studying in the first grade. The higher perceived Internet self-efficacy among the fourth-grade pre-service teachers can be attributed to their acquisitions from the computer courses they received and their higher level of Internet use for their assignments and projects in other courses. This finding is confirmed by the results of some studies on Internet self-efficacy, computer self-efficacy, and information literacy self-efficacy (Gündüz and Özdinç, 2008; Peng, Tsai and Wu, 2006; Akkoyunlu and Kurbanoğlu, 2003; Çavuş et al., 2007).

The pre-service teachers who frequently used the Internet for research were observed to have high perceived Internet self-efficacy. From this result, it could be concluded that the higher the pre-service teachers' frequency of Internet use for research, the higher their perceived Internet self-efficacy.

A positive moderately significant correlation was found between the pre-service teachers' perceived Internet self-efficacy and levels of Internet use for research. Thus, it could be argued that the higher the pre-service teachers' levels of Internet use for research, the higher their perceived Internet self-efficacy.

Giving pre-service teachers assignments and projects that can enhance their frequency of Internet use for research may enhance their perceived Internet self-efficacy, as well as their levels of Internet use for research. In order to increase their levels of Internet use for research, instructors could be recommended to teach pre-service teachers information about researching on the Internet along with computer literacy information in computer courses, to inform them about how to conduct research on the Internet and about the information resources on the Internet.

References

Akkoyunlu, B., & Kurbanoğlu, S. (2003). Öğretmen adaylarının bilgi okuryazarlığı ve bilgisayar öz-yeterlik inancı üzerine bir çalışma. *Hacettepe Üniversitesi Eğitim Fakültesi Dergisi*. 27, 11-20.

Akkoyunlu, B., & Kurbanoğlu, S. (2004). Öğretmenlerin bilgi okuryazarlığı öz-yeterlik algıları üzerine bir çalışma. *Hacettepe Üniversitesi Eğitim Fakültesi Dergisi*. 24, 1-10.

Akkoyunlu, B., & Orhan, F. (2003). Bilgisayar ve Öğretim Teknolojileri Eğitimi (BÖTE) Bölümü öğrencilerinin bilgisayar kullanma öz-yeterlik inancı ile demografik özellikleri arasındaki ilişki. *The Turkish Online Journal of Educational Technology*. 2(3).

Bandura, A. (1977). Self-efficacy: Toward a unifying theory of behaviour change. *Psychological Review*, 84, 191-215.

Bandura, A. (1995). Exercise of personal and collective efficacy in changing societies. In A. Bandura (Ed.). *Self-efficacy in changing societies* (pp. 1-45).New York: Cambridge University Press.

Bandura, A. (1997). *Self-efficacy: The exercise of control*. New York: W. H. Freeman and Company.

Çavuş, H., Gökdaş, İ., &Yıldız, R. (2007). Eğitim fakültesinde öğrenim gören öğrencilerin bilgisayara ilişkin öz-yeterlik algıları. *7th International Educational Technology Conference*. Cyprus: Near East University.

Doyle, C. S. (1994). *Information literacy in an information society: A concept for the information age*. Syracuse University, New York: ERIC, ED372763.

Ersoy, A., & Aktay, S. (2007). Prospective elementary school teacher's ways of Internet use while preparing their projects and homeworks. *7th International Education Technology Conference*. Cyprus: Near East University.

Gündüz, Ş., & Özdinç, F. (2008). İlköğretim ikinci kademe öğrencilerinin İnternet öz-yeterlikleri. *8th International Educational Technology Conference*. 6-9 Mayıs 2008. Anadolu Üniversitesi, Eskişehir.

Güngör, C., & Aşkar, P. (2004). E-öğrenmenin ve bilişsel stilin başarı ve İnternet öz-yeterlik algısı üzerindeki etkisi. *Hacettepe Üniversitesi Eğitim Fakültesi Dergisi*, 27, 116-125.

Joo, Y. J., Bong, M., & Choi, H. J. (2000). Self-efficacy for self regulated learning, academic self-efficacy, and Internet self-efficacy in web-based instruction. *Educational Technology and Development*, 48, 5-17

Küçük, M. (2002). *Öğretim elemanlarının İnternet'i araştırma amaçlı kullanma durumları*. Yüksek Lisans Tezi, Anadolu Üniversitesi, Sosyal Bilimler Enstitüsü, Eskişehir.

Liang, J.-C., & Tsai, C.-C. (2008). Internet self-efficacy and preferences toward constructivist Internet-based learning environments: A study of pre-school teachers in Taiwan. *Educational Technology & Society*, 11(1), 226-237.

Miltiadou, M., & Yu, C. H. (2000). Validation of the Online Technologies Self-Efficacy Scale (OTSES). (ERIC Document Reproduction Service No. ED 445672)

Peng, H., Tsai, C.-C., & Wu, Y.-T. (2006). University students' self-efficacy and their attitudes toward the Internet: The role of students' perceptions of the Internet. *Educational Studies*. 32, 73-86.

Rains, S. A. (2008). Seeking health information in the information age: The role of Internet self-efficacy. *Western Journal of Communication*, 72(1), 1-18.

Tsai, M. -J., & Tsai, C. -C. (2003). Information searching strategies in web-based science the role of Internet self-efficacy. *Innovations in Education and Teaching International*. 40, 43-50.

Wu, Y. -T. & Tsai, C. -C. (2006). University students' Internet attitudes and Internet self-efficacy: A study at three universities in Taiwan. *Cyberpsychology & Behavior*, 9(4), 441-450.